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EXAMINER

SAAD, ERIN BARRY

ART UNIT

PAPER NUMBER

1793

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01/25/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,963	Applicant(s) PAUL ET AL.	
	Examiner ERIN B. SAAD	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17, 19-28, 30-40 and 67-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 19-28, 30-40 and 67-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 12/2/2009. These drawings are accepted.

Claim Objections

2. Claim 30 is objected to because of the following informalities: claim 30 is dependent on cancelled claim 29. For the purpose of examination, claim 30 will depend on claim 17. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 73, 74 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 73, the original disclosure does not have support for the load cell being pre-loaded with a bonding pressure.

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Regarding claims 74, the original disclosure does not state that the load cell is fluidic.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 17, 19-23, 30-34, 66-67 and 73 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 is indefinite because it is unclear what is meant by "wherein timing application of the bonding pressure is determined by adjusting fluid mass in the fluid expansion unit". For the purpose of examination it will read "wherein a timing of the application of bonding pressure is determined by adjusting fluid mass in the fluid expansion unit".

Claim 73 is indefinite because it is unclear what is meant by "the load cell is preloaded with bonding pressure". It is not understood how a load cell could be preloaded. For the purpose of examination, the claim will read "the load cell measures a predetermined bonding pressure".

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

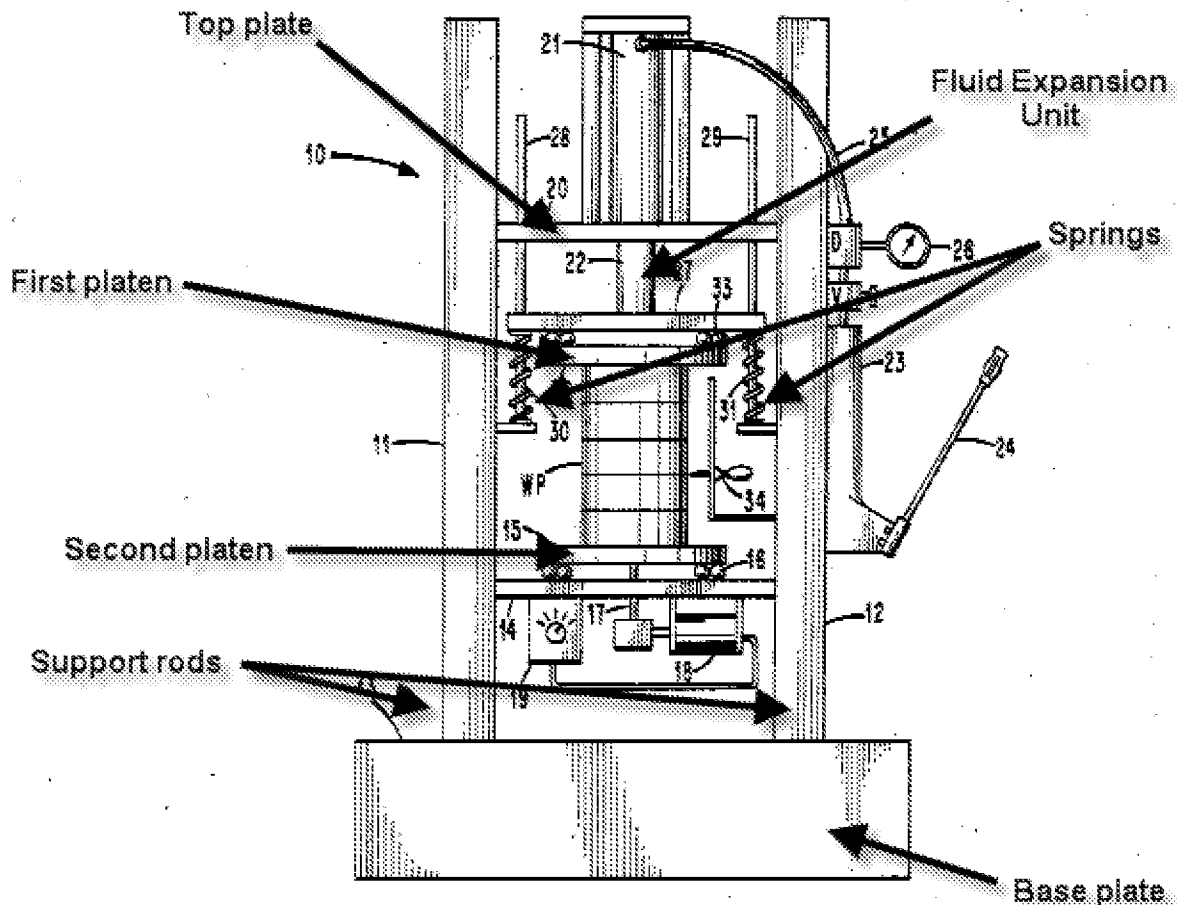
A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Barry, Jr. et al. (4,689,108).

Regarding claim 67, Barry discloses that the thermally assisted bonding unit further comprises a frame having a base plate 13, a top plate 20, and support rods 11, 12 positioned between and coupling the base plate and the top plate, the fluid expansion unit 22 positioned between the base plate and the top plate; and a first platen 32 and a second platen 15 positioned between the at least one fluid expansion unit and the bottom plate, the first platen contacting an upper surface of the laminae and the second platen contacting a lower surface of the laminae (shown below).



Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 17, 19, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781).

Regarding claim 17, McHerron discloses a method for bonding laminae together to form a device comprising providing a thermally assisted bonding unit comprising at

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least one fluid expansion unit 42, loading the laminae in the thermally assisted bonding unit, placing the thermally assisted bonding unit and laminae in a furnace, heating the laminae and the bonding unit in the furnace, and applying a bonding pressure to the laminae using the thermally assisted bonding unit (column 2 lines 24-53 and figure 4).

McHerron also discloses using a bellows that fills with gas from an inlet valve and a pressure relief valve. The thermal expansion of the bellows upon heating in the oven cooperates with the expansion block to exert the gas on the workpiece. The pressure relief valve may be set such that if the predetermined pressure threshold is reached in the bellows, any excess pressure from the bellows is relieved by the opening of the relief valve so it is not applied to the workpiece (column 6 lines 10-24). The faster the laminae are heated, the faster the bellows would be adjusted to accommodate the change in thermal expansion. This would indicate that the timing of the application of bonding pressure is determined by adjusting the fluid mass in the fluid expansion unit.

McHerron does not disclose that the laminae are heated to ± 50 C of the bonding temperature. However, to one skilled in the art at the time of the invention it would have been obvious to heat the laminae within a range close to the bonding temperature To ensure that the laminae are bonded. If heated too high above the bonding temperature, the laminae may be damaged. Heated too low below the bonding temperature, the laminae may not be bonded.

Regarding claim 19, McHerron discloses a belt/conveyorized furnace (column 4 lines 11-19).

Regarding claim 23, McHerron discloses thermally registering plural lamina using a registration fixture 14 prior to bonding laminae (column 3 line 45 to column 4 line 20).

11. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781), as applied to claim 17 and further in view of Alley et al. (5,232,145).

Regarding claim 20, McHerron does not specifically disclose forced convective heating of the laminae. However, Alley does disclose using forced convective heating with nitrogen (column 4 lines 7-44). To one skilled in the art at the time of the invention it would have been obvious to use forced convective heating with nitrogen to heat the laminae of McHerron because it provides an even heating of the laminae and is easily controlled by the user (column 44-68).

Regarding claim 21, McHerron does not specifically disclose using an inert gas in the furnace. However, Alley does disclose using an inert gas (column 4 lines 7-48). To one skilled in the art at the time of the invention it would have been obvious to use an inert gas furnace because Alley discloses that it is a well known gas to use in a solder furnace (column 4 lines 7-48) and prevents oxidation of the workpieces during bonding.

Regarding claim 22, McHerron does not disclose gas in the heater/oven. However, Alley does disclose a cover gas in the oven (column 4 lines 7-48). While Alley does not specifically disclose that the gas is contained in the system, it would be obvious to one skilled in the art at the time of the invention that the gas would be contained in the oven of Alley since the oven is covered and Alley discloses that the gas flow is controlled in the oven (column 5 lines 44-68).

12. Claim 30-33 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781) as applied to claim 29 above, and further in view of Callahan et al. (2005/0007748).

Regarding claim 30, McHerron does not specifically disclose that the bonding unit further includes at least one pressure regulating spring, and where laminae are positioned between the at least one pressure regulating spring and the at least one fluid expansion unit. However, Callahan does disclose a pressure regulating spring 24 for a unit for holding circuit pieces/laminae together where the laminae is located between the spring and the top plate (figure 3. To one skilled in the art at the time of the invention it would have been obvious to use a pressure regulating spring in the unit of McHerron because Callahan discloses that it distributes the compressive forces to create an even press (paragraphs 0004-0006).

Regarding claim 31, McHerron does not specifically disclose that the bonding laminae comprises applying bonding pressure stored in the at least one spring to the laminae. However, the spring 24 of Callahan would apply pressure stored in the spring to the laminae. To one skilled in the art at the time of the invention it would have been obvious to use the spring of Callahan to apply bonding pressure stored in the at least one spring to the laminae of McHerron to distribute the compressive forces to create an even press (paragraphs 0004-0006).

Regarding claim 32, McHerron discloses that that the heat causes the engager 36 to expand relative to the top plate 16 and the bottom plate 12 such that a given time

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after heating, the engager engages both the top plate and the laminae 22 (column 6 lines 10-40 and figure 4).

Regarding claim 33, McHerron does not disclose that when the engager engages both the top plate and the laminae, final bonding pressure stored in the at least one spring is applied to the laminae. However, Callahan does disclose a spring that when used in the unit of McHerron would apply pressure stored in the spring to the laminae. To one skilled in the art at the time of the invention it would have been obvious to use the spring of Callahan to apply bonding pressure stored in the at least one spring to the laminae of McHerron to distribute the compressive forces to create an even press (paragraphs 0004-0006). It also would have been obvious that when the engager is heated and applies pressure to the laminae, the spring (located below the laminae) is going to have pressure stored and will press against the laminae.

Regarding claim 66, McHerron does not disclose at least one pressure regulating spring functionally associated with the unit to apply pressure to the laminae. However, Callahan does disclose a pressure regulating spring 24 for a unit for holding circuit pieces/laminae together where the laminae is located between the spring and the top plate (figure 3). To one skilled in the art at the time of the invention it would have been obvious to use a pressure regulating spring in the unit of McHerron because Callahan discloses that it distributes the compressive forces to create an even press (paragraphs 0004-0006).

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13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781) as applied to claim 17.

Regarding claim 34, McHerron does not specifically disclose prebonding a first stack of at least two laminae and prebonding a second stack of at least two laminae, the first stack and the second stack being subsequently bonded together. However, selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results; In re Gibson, 39 F.2d 975, 5USPQ 230 (CCPA 1930) (MPEP 2144). To one skilled in the art at the time of the invention it would have been obvious to bond the laminae in a sequence suitable to create a desirable end product.

14. Claims 35, 38-40 and 72-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781) in view of Nagaoka et al. (2004/0012122) and Childers et al. (2004/0086427).

Regarding claim 35, McHerron discloses a method for bonding plural lamina together to form a multilayered device. McHerron discloses a thermally assisted bonding device 310 comprising a frame (formed with the pins 18) functionally associated with the laminae 22 with the device. McHerron discloses a belt/conveyorized furnace to continuously bond the laminae (column 4 lines 11-19).

McHerron does not specifically disclose that the laminae are forming a microfluidic device. McHerron does disclose that the laminae are thin films stacked to form a multilayer thin film structure (column 1 lines 16-27). One reading McHerron as a whole would appreciate that the reference does not specifically disclose what is formed

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by bonding the multilayer thin films. Childers discloses that a microfluidic device is formed from stacking multilayer thin films. To one skilled in the art at the time of the invention it would have been obvious to use the thermal expansion device of McHerron to bond multilayer films forming a microfluidic device to prevent movement of the layers during bonding and to prevent damage caused by overpressure.

McHerron also discloses that the pressure relief valve may be set to remove excess pressure when a predetermined value is exceeded (column 6 lines 10-24). McHerron does not specifically disclose how the exceeded pressure is determined. However, Nagaoka discloses using a load cell with a pressure reducing valve for detecting pressure (paragraph 0055). To one skilled in the art at the time of the invention it would have been obvious to use a load cell with the expansion unit of McHerron to prevent an over pressure from damaging the laminae during heating.

Regarding claim 38, McHerron discloses stacking and registering the laminae on the device (column 3 line 45 to column 4 line 19)

Regarding claim 39, McHerron discloses a thermally assisted registration 14 (column 3 lines 45-67 and figure 4).

Regarding claim 40, McHerron discloses that thermally assisted registration comprises a registration device 18 (column 5 lines 52-67 and figure 4).

Regarding claim 72, McHerron discloses a method for bonding laminae together to form at least a portion of a device comprising providing a bonding unit comprising a frame, a platen 14 assembly for applying a bonding pressure to the laminae; placing laminae in the bonding unit; placing the bonding unit and laminae in a furnace; heating

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the laminae; and bonding the laminae using the thermally assisted bonding unit (column 2 lines 28-54 and figure 4).

McHerron does not specifically disclose that the laminae are forming a microfluidic device. McHerron does disclose that the laminae are thin films stacked to form a multilayer thin film structure (column 1 lines 16-27). One reading McHerron as a whole would appreciate that the reference does not specifically disclose what is formed by bonding the multilayer thin films. Childers discloses that a microfluidic device is formed from stacking multilayer thin films. To one skilled in the art at the time of the invention it would have been obvious to use the thermal expansion device of McHerron to bond multilayer films forming a microfluidic device to prevent movement of the layers during bonding and to prevent damage caused by overpressure.

McHerron also discloses that the pressure relief valve may be set to remove excess pressure when a predetermined value is exceeded (column 6 lines 10-24). McHerron does not specifically disclose how the exceeded pressure is determined. However, Nagaoka discloses using a load cell with a pressure reducing valve for detecting pressure (paragraph 0055). To one skilled in the art at the time of the invention it would have been obvious to use a load cell with the expansion unit of McHerron to prevent an over pressure from damaging the laminae during heating.

Regarding claim 73, McHerron discloses that the pressure relief valve may be set to remove excess pressure when a predetermined value is exceeded (column 6 lines 10-24). McHerron does not specifically disclose how the exceeded pressure is determined. However, Nagaoka discloses using a load cell with a pressure reducing

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valve for detecting pressure (paragraph 0055). To one skilled in the art at the time of the invention it would have been obvious to use a load cell with the expansion unit of McHerron to prevent an over pressure from damaging the laminae during heating.

15. Claims 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781), Nagaoka et al. (2004/0012122) and Childers et al. (2004/0086427) in view of Alley et al. (5,232,145).

Regarding claim 36, McHerron does not specifically disclose forced convective heating of the laminae. However, Alley does disclose using forced convective heating with gas (column 4 lines 7-44). To one skilled in the art at the time of the invention it would have been obvious to use forced convective heating with nitrogen to heat the laminae of McHerron because it provides an even heating of the laminae and is easily controlled by the user (column 44-68).

Regarding claim 37, McHerron does not specifically disclose using an inert gas in the furnace. However, Alley does disclose using an inert gas (column 4 lines 7-48). To one skilled in the art at the time of the invention it would have been obvious to use an inert gas furnace because Alley discloses that it is a well known gas to use in a solder furnace (column 4 lines 7-48) and prevents oxidation of the workpieces during bonding.

16. Claims 68-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781) in view of Nagaoka et al. (2004/0012122).

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Regarding claim 68, McHerron discloses a method for bonding laminae together to form a device comprising providing a thermally assisted bonding unit comprising a frame having a base plate 12, a top plate 16 and support rods 18 positioned between the base plate and the top plate, at least one fluidic expansion 42 unit being positioned between the base plate and the top plate, and a platen 14 assembly for contacting laminae 22, and bonding laminae together using the device (figure 4, column 2 lines 29-54).

McHerron discloses that the pressure relief valve may be set to remove excess pressure when a predetermined value is exceeded (column 6 lines 10-24). McHerron does not specifically disclose how the exceeded pressure is determined. However, Nagaoka discloses using a load cell with a pressure reducing valve for detecting pressure (paragraph 0055). To one skilled in the art at the time of the invention it would have been obvious to use a load cell with the expansion unit of McHerron to prevent an over pressure from damaging the laminae during heating.

Regarding claim 69, McHerron discloses that the thermally assisted bonding unit further comprises a gap height adjustment screw 18 coupled to the top plate 16 (figure 4).

Regarding claim 70, McHerron discloses at least one engager which expands when the unit is heated such that the gap height decreases and a compressive force is applied to the laminae (column 2 lines 29-54). McHerron does not specifically disclose that the gap height is zero when the compressive force is applied to the laminae. However McHerron does disclose that the gap between the pressure plate and the

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expansion block is changed thereby applying pressure the workpiece (column 2 lines 60-65). It is the Examiner's position that it would naturally flow that the gap would have to become zero in order for the force to be applied to the laminae. If the gap height was not at zero, there would be no force being applied.

17. Claim 74 rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781), Nagaoka et al. (2004/0012122) and Childers et al. (2004/0086427) as applied to claim 72 above, and further in view of Schomburg et al. (3,407,652).

Regarding claim 74, the type of load cell as taught by McHerron in view of Nagaoka and Childers is not specified. However, Schomburg discloses a spring based load cell for measuring pressure (abstract, column 1 lines 28-50). To one skilled in the art at the time of the invention it would have been obvious to use a load cell that would determine an accurate calculation of the pressure to prevent damage to the device being bonded.

18. Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over McHerron et al. (6,892,781), Nagaoka et al. (2004/0012122) and Childers et al. (2004/0086427) as applied to claim 72 above, and further in view of Johnson (5,313,023).

Regarding claim 75, the type of load cell as taught by McHerron in view of Nagaoka and Childers is not specified. However, Johnson discloses a spring based load cell for measuring pressure (claim 28 and column 1 lines 5-15). To one skilled in

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the art at the time of the invention it would have been obvious to use a load cell that would determine an accurate calculation of the pressure to prevent damage to the device being bonded.

Allowable Subject Matter

Claim 71 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record failed to teach or suggest a thermally assisted bonding unit with plural engagers. Prior art, McHerron teaches using one engager/platen for pressing onto the laminae. There is no motivation for incorporating a plurality of engagers into McHerron since the arrangement of McHerron a single flat engager for holding down the laminae

19. Claims 24-28 are allowed.

The following is an examiner's statement of reasons for allowance: (As stated in the previous Office Action) Regarding claim 24, the Prior Art, McHerron, discloses a registration fixture 14 (figure 14). McHerron fails to teach or suggest a registration fixture that includes a flexible laminae engagement portions that flex when displaced by expanding laminae. There is no motivation or teaching to incorporate a flexible laminae engagement portions that flex when displaced by expanding laminae.

Claims 25-28 are dependent on claim 24.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

20. Applicant's arguments filed 12/2/2009 have been fully considered but they are not persuasive.

21. The Applicant argues that McHerron is silent as to the issue of adjusting the timing associated with applying bonding pressure using a fluid expansion unit to apply pressure to plural laminae.

The Examiner disagrees. McHerron discloses that the temperature is associated with the thermal expansion (column 4 lines 24-67, and column 6 lines 10-24). The change in temperature is going to change the rate of thermal expansion. Changing the temperature would then change the timing of the adjustment of the pressure being applied to the workpieces.

22. Regarding claim 17, the Applicant argues that McHerron does not teach bonding plural laminae to form a microfluidic device.

Claim 17 does recite disclose a microfluidic device.

23. The Applicant argues that claim 35 has been amended to recite a method including a load cell. The Applicant argues that a load cell is a substantially constant

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volume device that stores bonding pressure and then applies the stored bonding pressure to laminae at the desired time.

The Examiner disagrees. The definition of a load cell is a transducer which converts force into a measurable electrical output. Although there are many varieties of load cells, strain gage based load cells are the most commonly used type. A load cell does not store pressure, it measures pressure and converts into an electrical output. Since there is no clear definition of a load cell in the specification, the Examiner examined the claims based on this known definition.

24. Claims 17, 29-30 and 67 are no longer rejected under Barry Jr. et al.

25. The Applicant argues that Ally does not cure the deficiencies of McHerron.

The Examiner disagrees. As stated in the rejection above, it is the Examiner's position that McHerron teaches the claimed invention. Ally was used as a secondary reference to show it would have been obvious to use a conveyor oven as claimed for heating the laminae.

26. The Applicant argues that Callahan does not disclose a bonding unit comprising at least one fluid expansion unit.

As stated in the rejection above, it is the Examiner's position that McHerron teaches the claimed invention. The Examiner acknowledges that Callahan does not disclose a bonding unit with at least one fluid expansion unit. However, Callahan was simply used as a secondary reference to McHerron to show that it would have been obvious to use a spring to distribute the compressive forces to create an even press (paragraphs 0004-0006).

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27. The Applicant argues that McHerron and Ally do not teach a load cell.

The Examiner acknowledges that McHerron and Ally do not teach a load cell. A new rejection with a load cell has been provided above.

28. Claim 24-28 have been allowed as stated in the "Allowable subject Matter"

29. Claim 68 has now been rejected because the Applicant removed "a spring to be positioned between the load stage and the bottom/base plate" which was indicated as the allowable subject matter in the previous Action.

30. New Claims 72-75 have been rejected above.

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIN B. SAAD whose telephone number is (571)270-3634. The examiner can normally be reached on Monday through Thursday from 8am-5pm Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. B. S./
Examiner, Art Unit 1793
1/6/2010

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793